SASKATCHEWAN SOIL SURVEY MAPS: APPLICATION TO AGRONOMY AND PRECISION AGRICULTURE

by

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SOILS AND CROPS
PRAIRIELAND PARK , SASKATOON
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OUTLINE

1. PRECISION AG – 18 YEARS : THE JOURNAL

2. SASK. THE FIRST SOIL SURVEY

3. SASK. THE SECOND SOIL SURVEY

4. SOILS & CROPS 2018 – PAPER MAPS CANSIS
SK SIS : THE FUTURE

1. PRECISION AGRICULTURE – THE JOURNAL

1.*Began in 1999 – now 18 years- all online*

2.Most papers are about the technology – not agronomy

3.The few that deal with variable rate N show little benefit to variable rate

4.Almost none even mention the soil(s)

5.How can we compare methods if we do not know the soil ??

How can we compare methods of Prec Ag if we do not know the soil ??

How can we develop protocols for Prec Ag if we do not know the soil ??

The soil map info provides the framework to develop discreet methods based on SOIL types

2. The First Soil Survey 1920-1950

The first survey mapped the LAND not the SOIL

Regina : Hv Clay

Weyburn: Loam

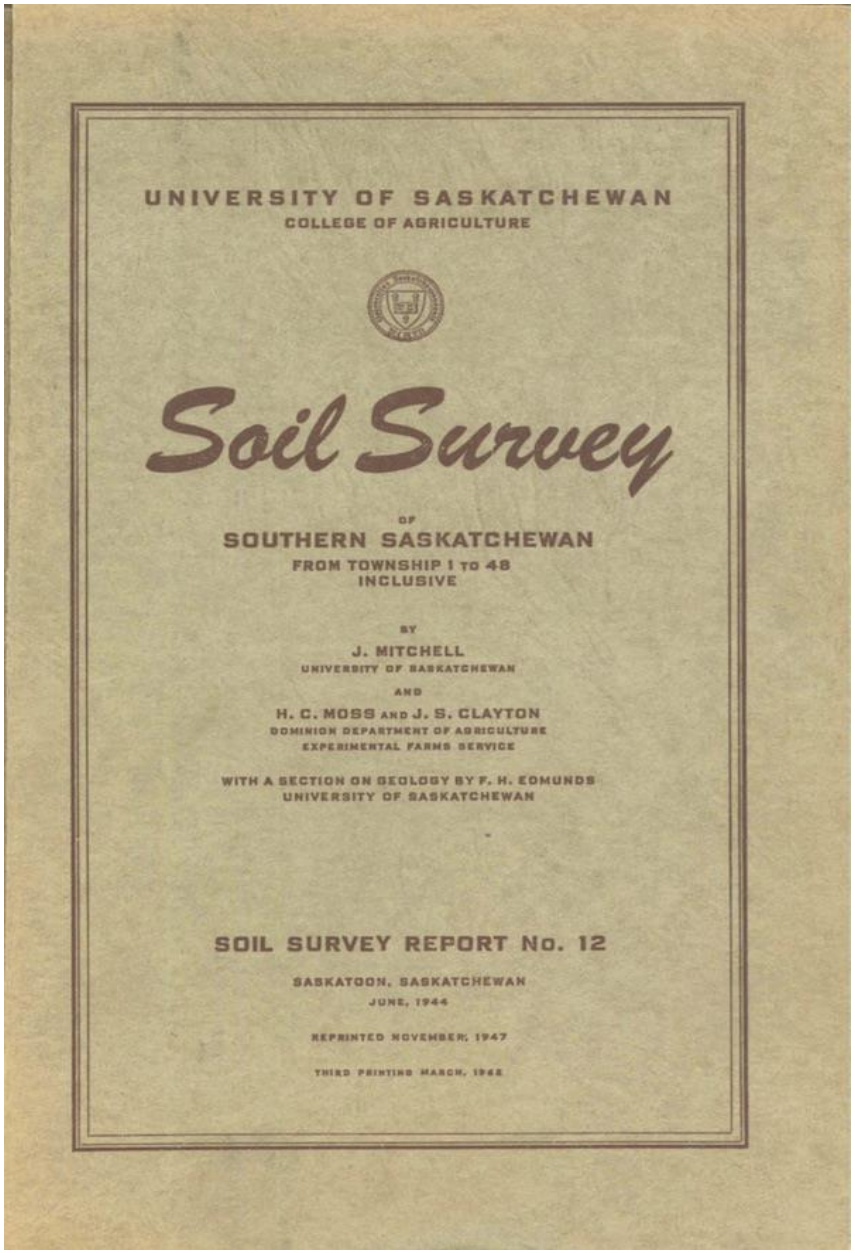
Regina Heavy Clay and Weyburn Loam were household names

All agronomic research and extension was based on the unified concept of

SOIL SURVEY REPORT & MAP # 12

AND

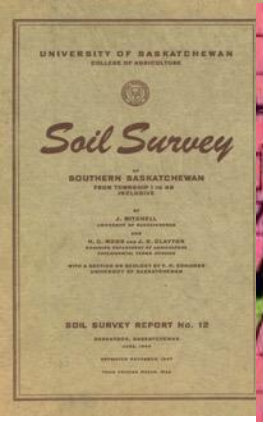
SOIL SURVEY REPORT & MAP # 13



SOIL SURVEY REPORT # 12

Up to Township 48
(Prince Albert)

Scale 1 inch= 8 miles



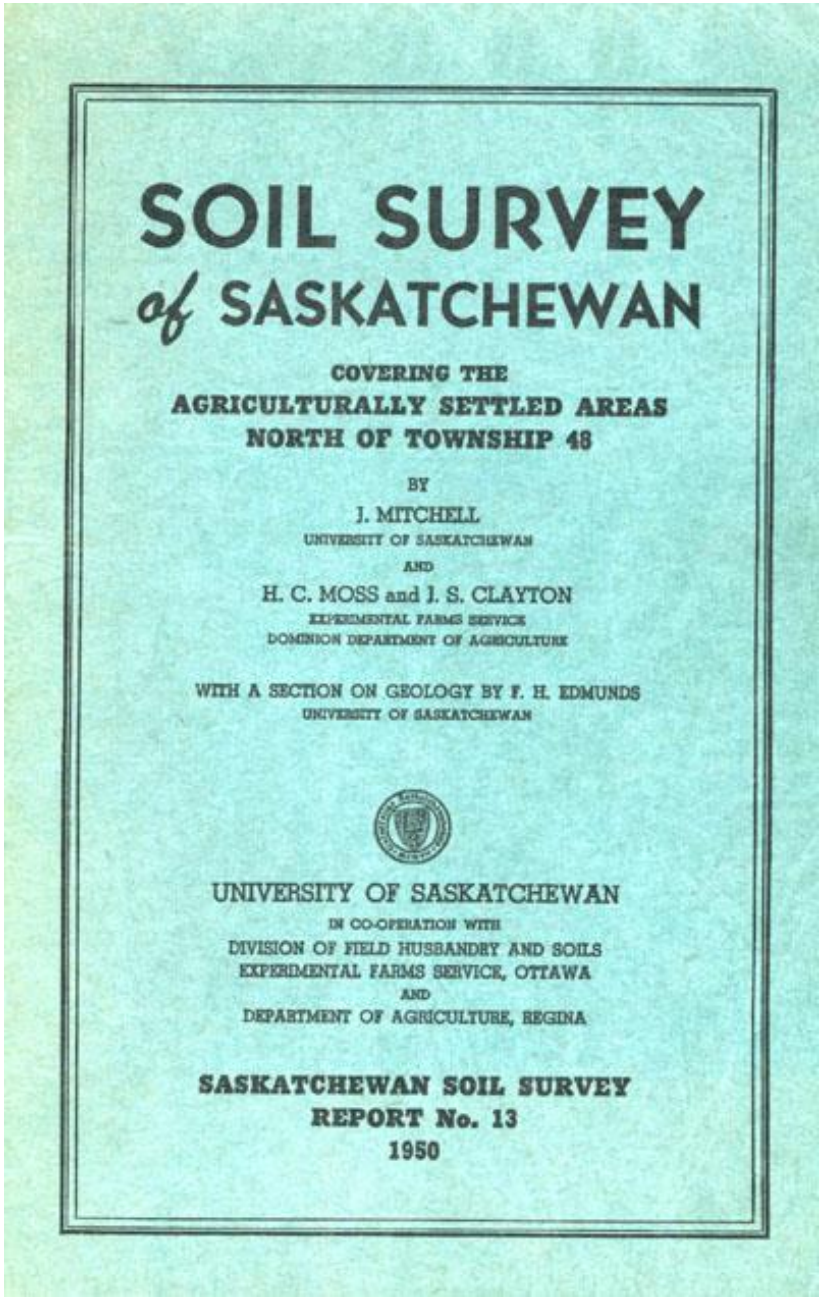
Scale 1 inch=8 miles

Soil Association , Texture &topography tell it all

Soil Association = One Parent Material

in One Soil Zone

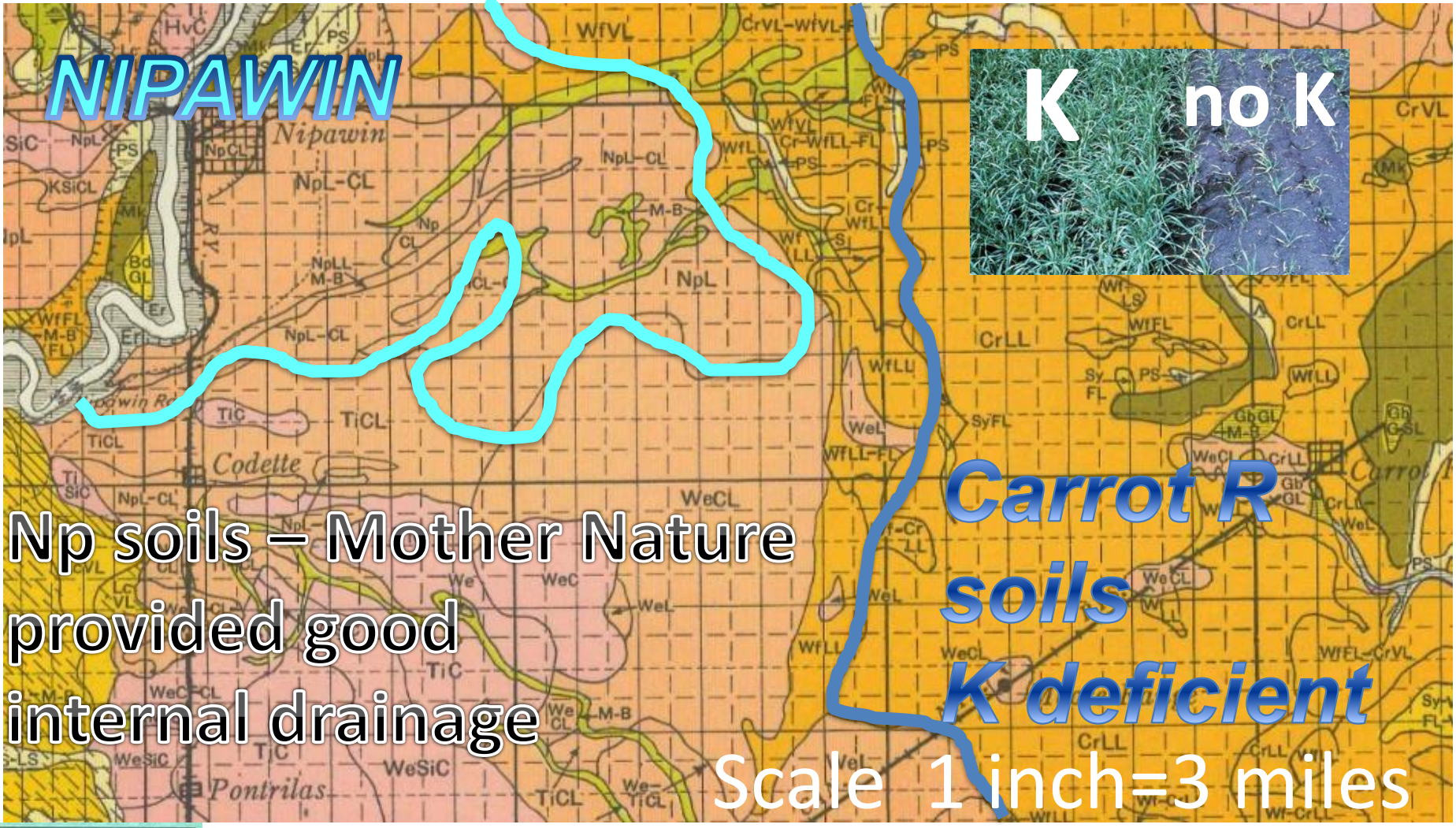
Soil Zone	Glacial Till	Lacustrine (Medium)
BROWN	Haverhill	Fox Valley
DARK BROWN	Weyburn	Elstow
BLACK	Oxbow	Blaine Lake
THICK BLACK	Yorkton	Melfort
GREY BLACK	Whitewood	Kamsack
GREY	Waitville	(Dorintosh)



SOIL SURVEY REPORT # 13

Ag areas north of Township 48

Scale 1 inch= 3 miles



North of Tp 48 i.e. P A

CANSIS

HOW WAS #12 & #13

INFORMATION USED

FOR GOOD AGRONOMY?

#12 Soils Map was right beside the phone

" You are from Cupar. ? are you north of town in the rolling land with stones (OxbowLoam) or south of town in the flat clay with no stones (Indian Head Clay)?"

SASK. SOIL TESTING LAB 1966-1994

* EVERY FARM SAMPLE WAS ASSIGNED A SOIL ASSOCIATION AND TEXTURE

* THE FIRST FARM SOIL TEST REPORT IN 1966 WAS GENERATED BY COMPUTER

*SOIL TEST SUMMARIES BY SOIL ASSCOCIATION WERE GENERATED

* WHEN THE FIRST SURVEY WAS COMPLETED IT FORMED THE FRAMEWORK TO COORDINATE ALL RESEARCH AND EXTENSION WORK FOR DECADES.

* SOIL ASSCOCIATION AND TEXTURE (e.g.REGINA HEAVY CLAY OR WEYBURN LOAM) WERE 'EVERYDAY TERMS' TO DESCRIBE THE SOIL WHERE RESEARCH WAS CONDUCTED OR FARM RECOMMENDATIONS WERE MADE.

* EVERY SOIL SAMPLE SUBMITTED TO THE SASK SOIL TESTING LAB FROM 1966 TO 1994 WAS LABELLED WITH SOIL ASSOCIATION AND TEXTURE.

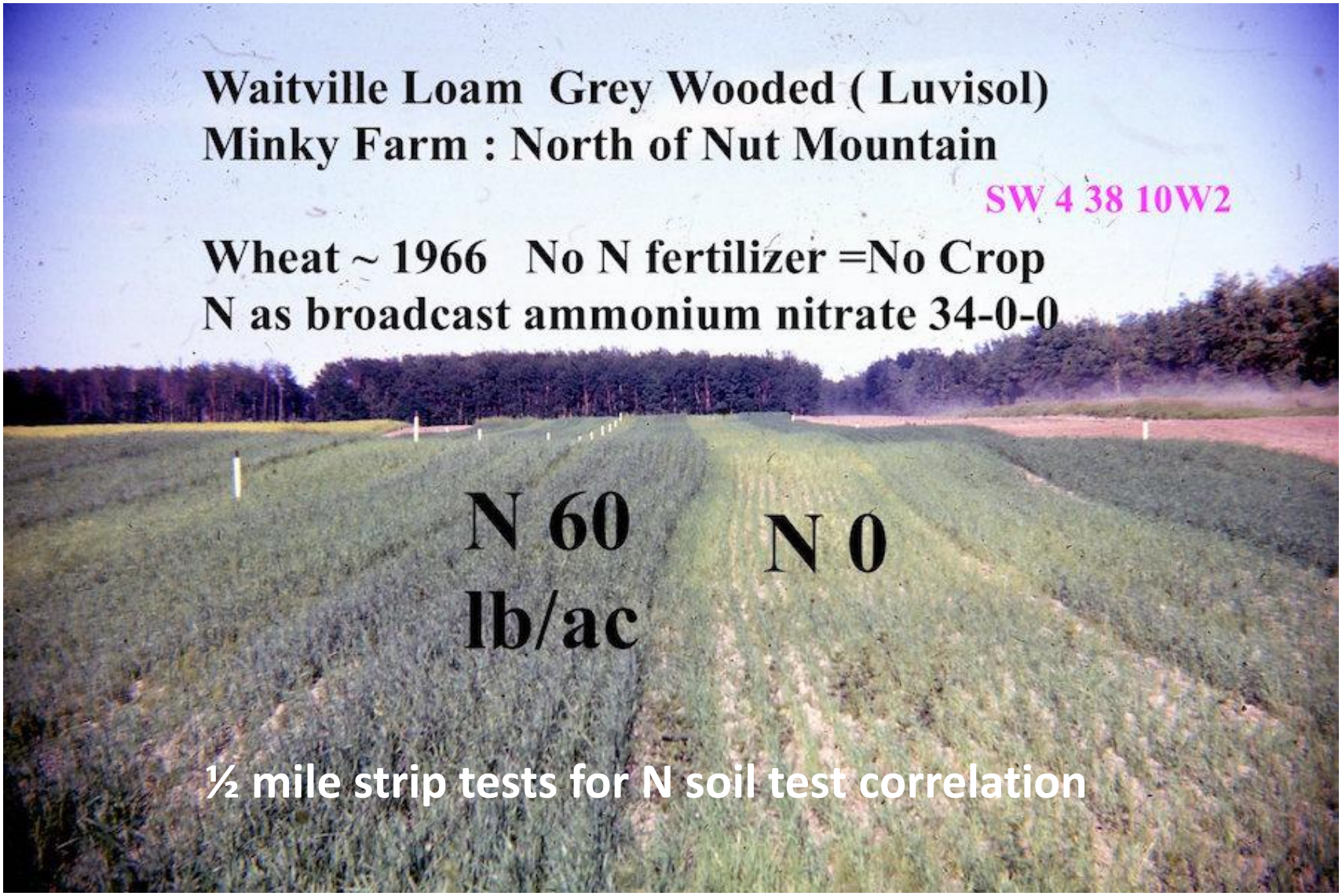
* SOIL TEST DATA SUMMARIES BY ASSOCIATION WERE USED TO FURTHER CHARACTERIZE SOILS

Let us look at an example of

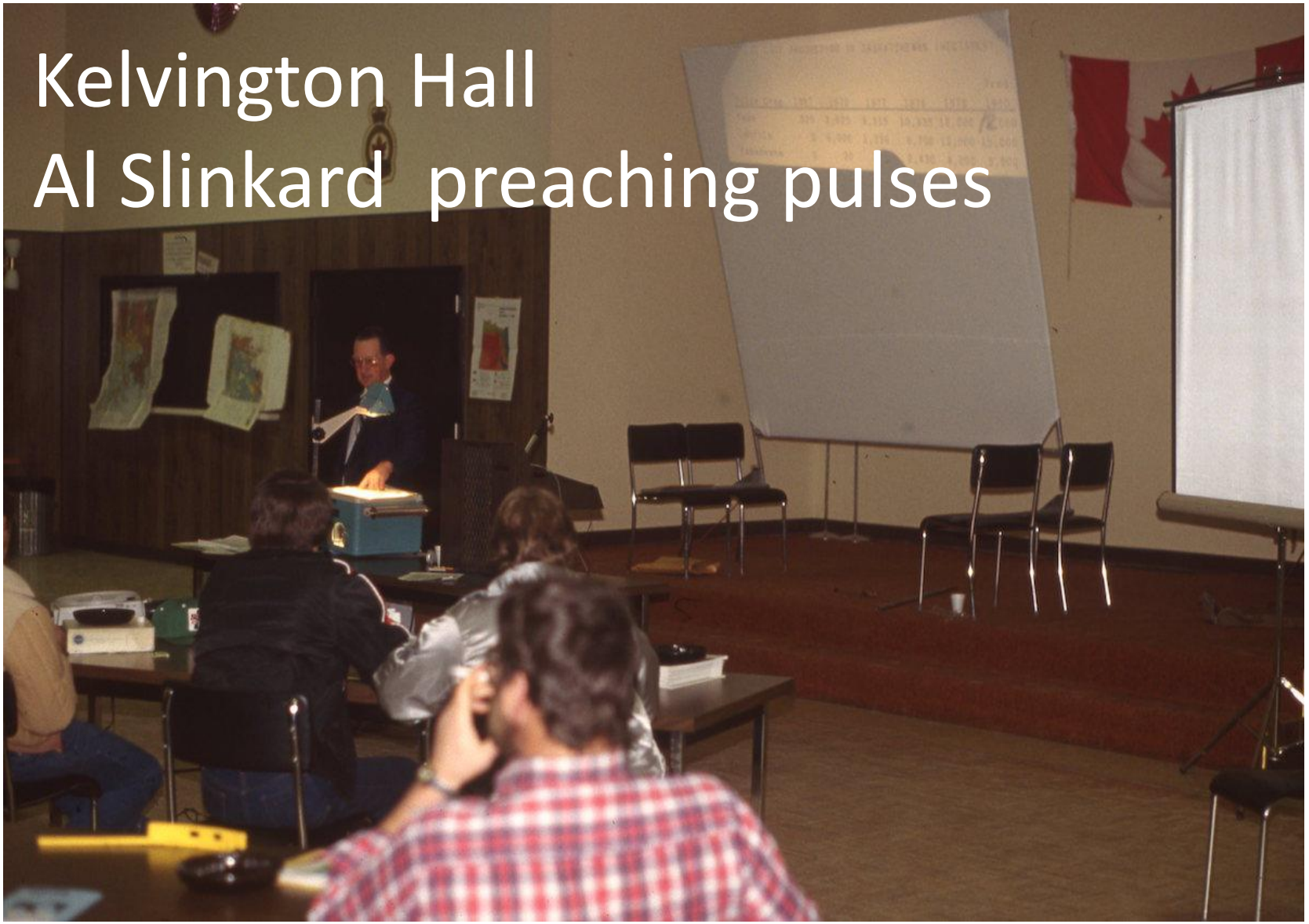
the necessity of soil map info to do

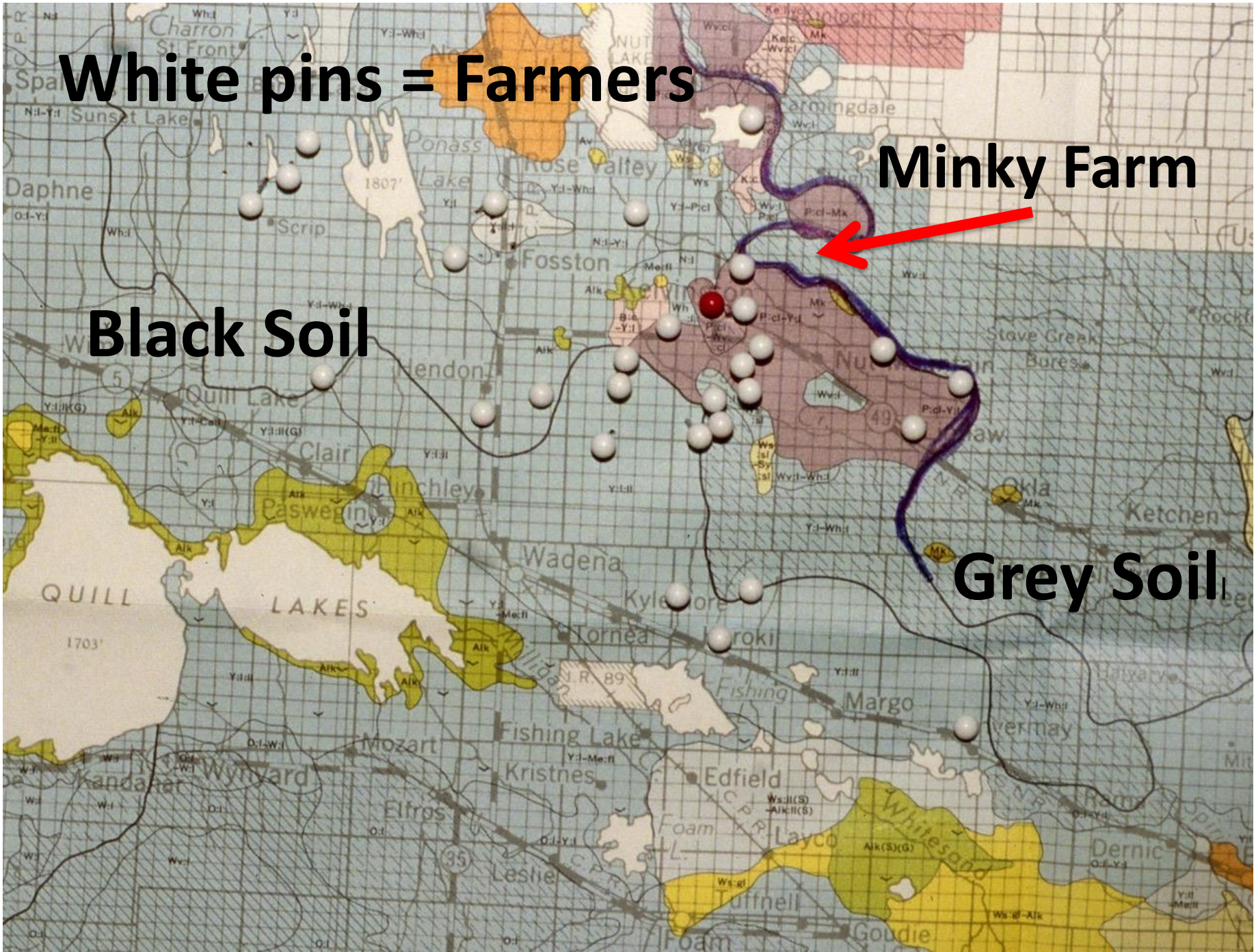
good agronomy:

Kelvington Area 1960s/70s


Waitville Loam Grey Wooded (Luvisol)
Minky Farm : North of Nut Mountain
SW 4 38 10W2
Wheat ~ 1966 No N fertilizer =No Crop
N as broadcast ammonium nitrate 34-0-0
N 60 lb/ac
N 0
½ mile strip tests for N soil test correlation

Kelvington Hall
Al Slinkard preaching pulses




White pins = Farmers
Minky Farm
Black Soil
Grey Soil
Fosston
Quill Lake
Clair
Wadena
Tornea
Margo
Fishing Lake
Mozart
Wynyard
Edfield
Kristnes
Elfros
Leslie
Tuffnell
Layco
Whitesand
Dernic
Ketchen
Okla
Stove Creek
Bures
Rose Valley
Daphne
Scrip
Sunset Lake
Charron L.
St Front
Ponass Lake
Kendon
Pasweguin
Kinchley
QUILL LAKES
1703'
1807'
Foam L.
Foam
Goudie
Kandahar
Fishing
Vermay
Farmingdale

3. The Second Soil Survey 1950 to 1990s

The second survey used a map unit that showed approximate distribution of individual soil profiles within a land unit. e.g Weyburn 3 : Loam

3 = Soil Profile types

The additional information is very useful in understanding how the soils relate to the landscape and to WATER over and through the soils. The soil profile is the 10,000 year record of water flux at soil surface.

The Second Soil Survey was published in 3 formats

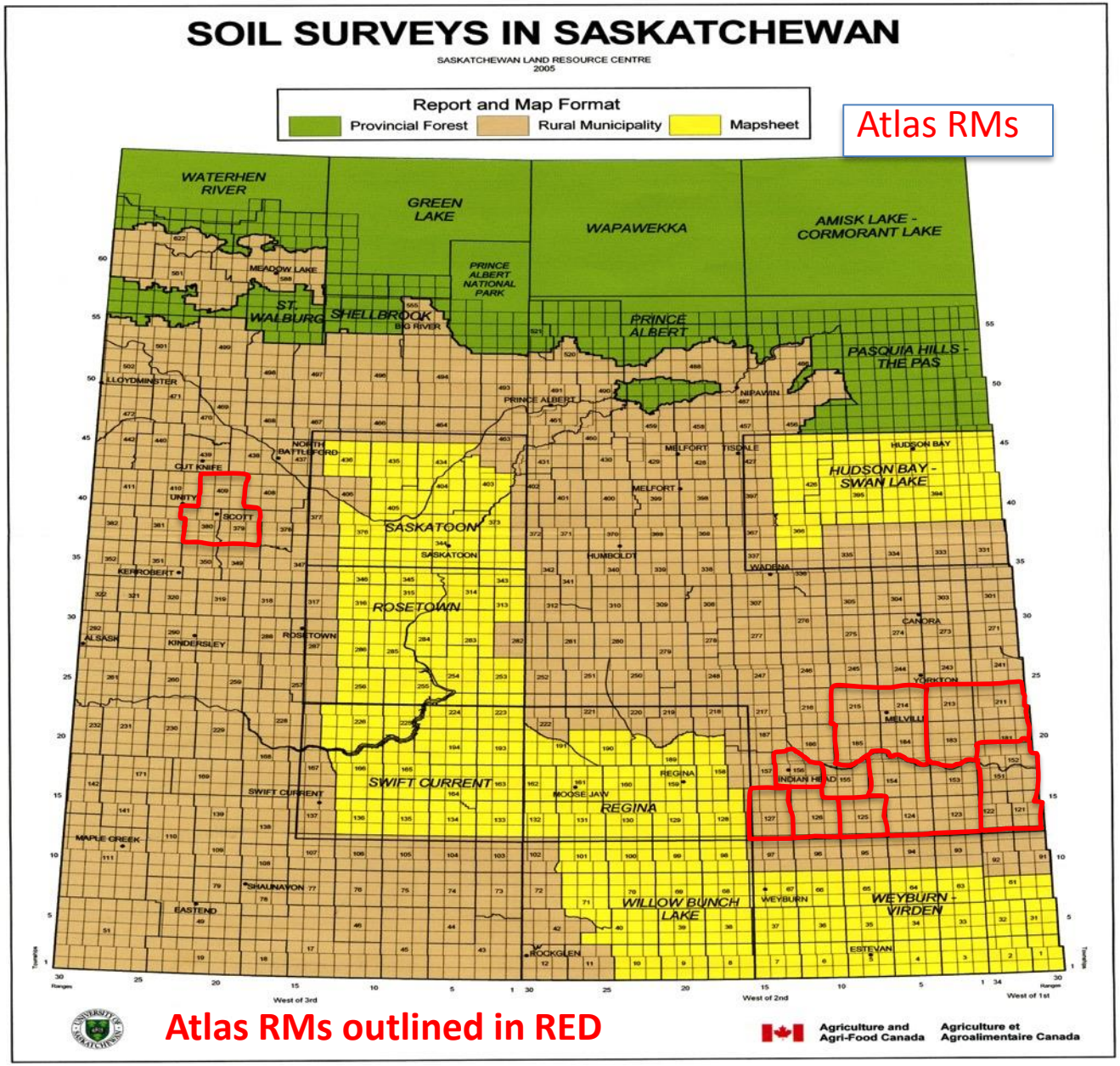
The Second Soil Survey was published in 3 formats

1. Colored maps on basis of National Topographic System Map Sheets ~ 1/3 of Ag area- 89 RMs

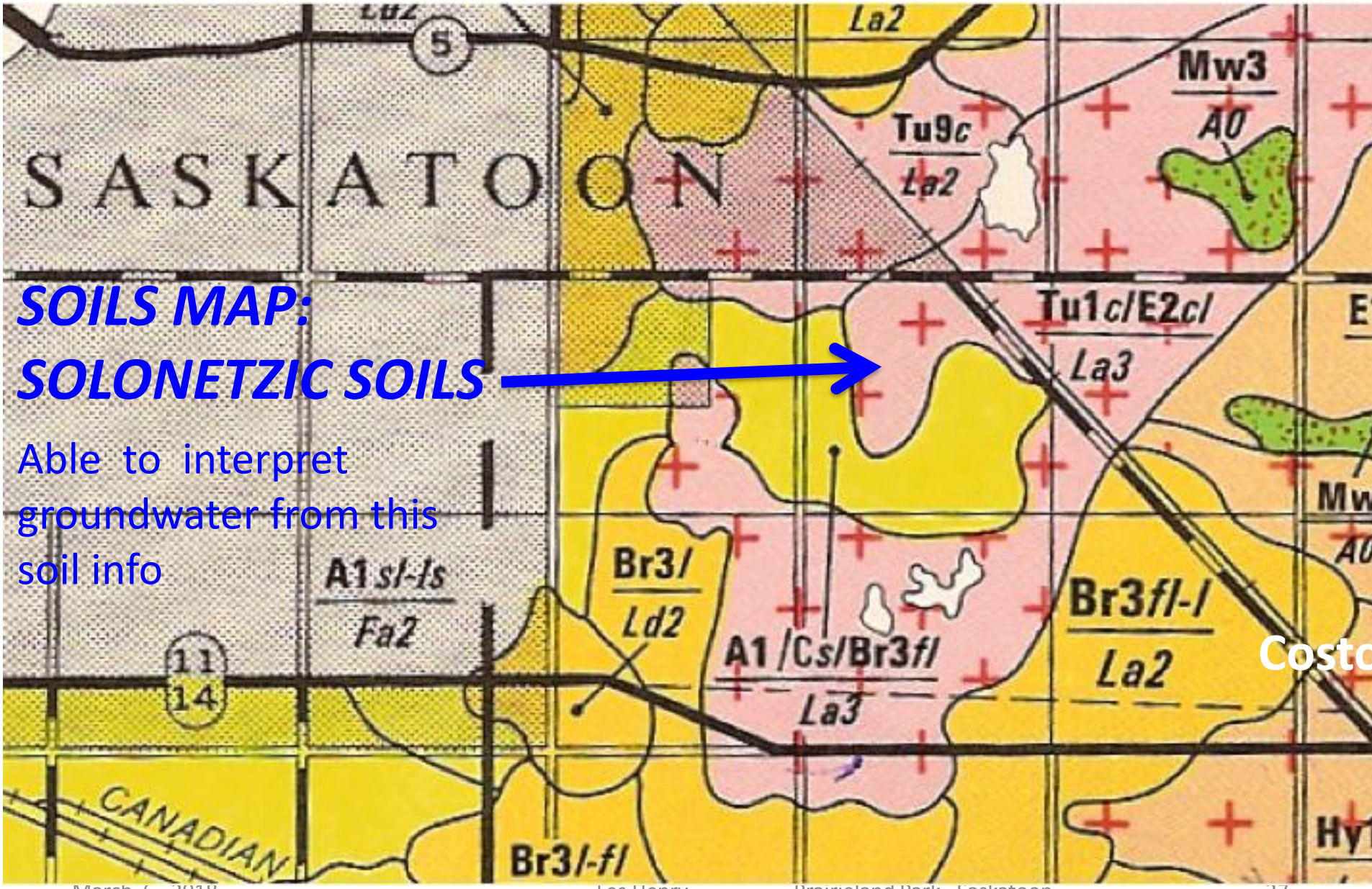
2. Detailed Atlases of small groups of RMs with colored maps of basic soils information plus several themes e.g. salinity, topography, geology, etal. 24 RMs only

3. Individual RM reports and maps 8 ½ x 11inch and in black and white- good information but hard to use. 186RMs

SCALE = 1 INCH = 2 MILES

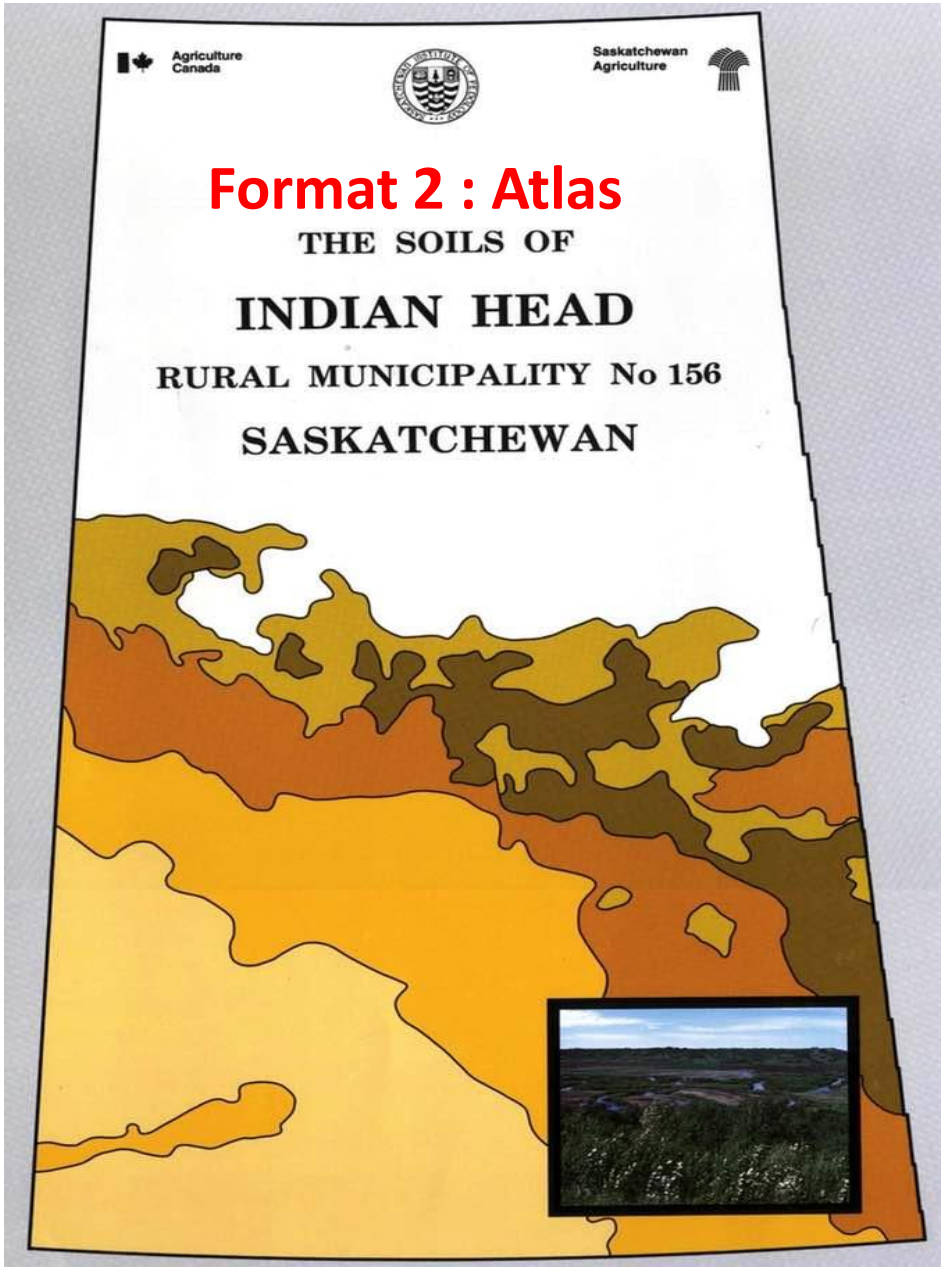

SOIL SURVEYS IN SASKATCHEWAN
SASKATCHEWAN LAND RESOURCE CENTRE
2005
Report and Map Format
Provincial Forest
Rural Municipality
Mapsheet
Atlas RMs
WATERHEN RIVER
GREEN LAKE
WAPAWEKKA
AMISK LAKE - CORMORANT LAKE
PRINCE ALBERT NATIONAL PARK
PRINCE ALBERT
PASQUIA HILLS - THE PAS
ST. WALBURG
SHELLBROOK
BIG RIVER
MEADOW LAKE
LLOYDMINSTER
PRINCE ALBERT
NIPAWIN
NORTH BATTLEFORD
MELFORT
TISDALE
HUDSON BAY
HUDSON BAY - SWAN LAKE
GUT KNIFE
UNITY
SCOTT
SASKATOON
SASKATOON
HUMBOLDT
WADENA
KERROBERT
ROSETOWN
ROSETOWN
ALSASK
KINDERSLEY
CANORA
YORKTON
MELVILLE
SWIFT CURRENT
SWIFT CURRENT
REGINA
MOOSE JAW
REGINA
INDIAN HEAD
MAPLE CREEK
SHAUNAVON
EASTEND
WILLOW BUNCH LAKE
WEYBURN
WEYBURN - VIRDEN
ESTEVAN
ROCKGLEN
West of 3rd
West of 2nd
West of 1st
Atlas RMs outlined in RED
Agriculture and Agri-Food Canada
Agriculture et Agroalimentaire Canada

Format 1 :NTS Mapsheet e.g. Saskatoon 89RMs



SOILS MAP:
SOLONETZIC SOILS

Able to interpret groundwater from this soil info



Atlases Provide :

Soils

Geology

Interpretive maps

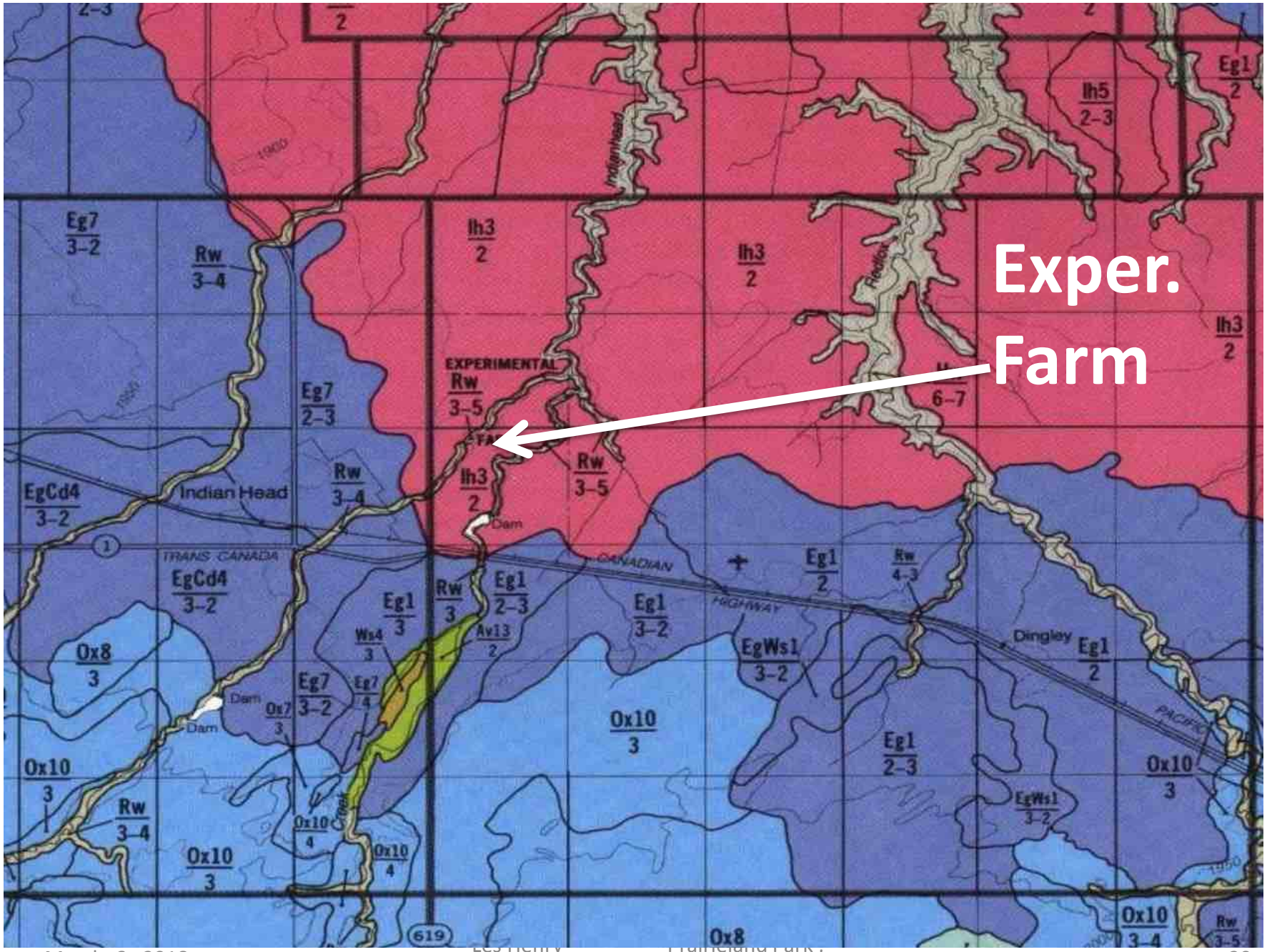
Salinity

Capability

Surface Drainage & Wetlands

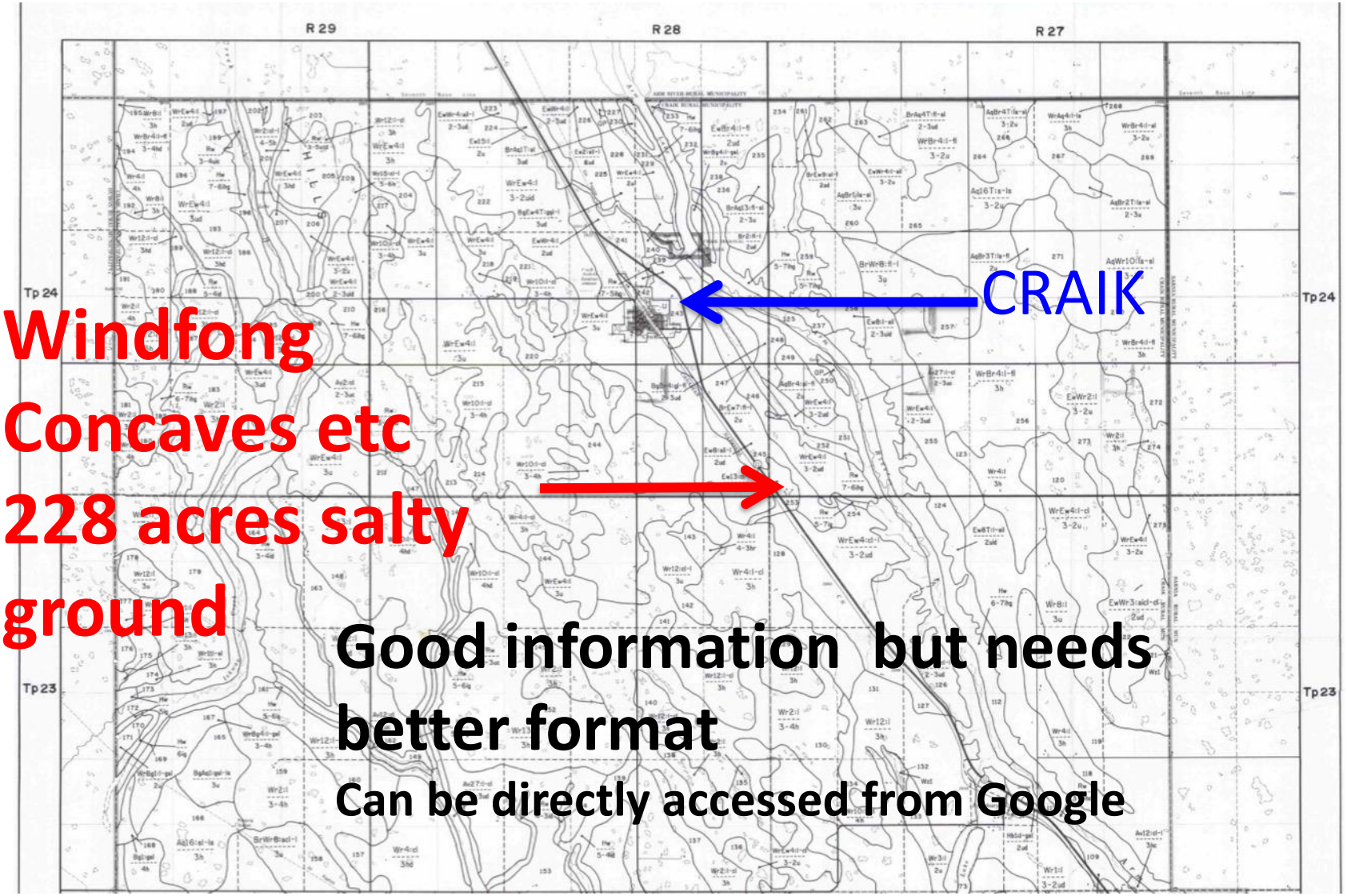
Productivity

Stones & more


Exper.
Farm
EXPERIMENTAL
FARM
Indian Head
Dam
TRANS CANADA
CANADIAN
HIGHWAY
Dingley
PACIFIC
Eg7
3-2
Rw
3-4
Ih3
2
Rw
3-5
EgCd4
3-2
Eg7
2-3
Eg1
3
Rw
3
Eg1
2-3
Ws4
3
Av13
2
Ox8
3
Ox7
3
Eg7
4
Ox10
3
Ox10
4
Eg1
3-2
Eg1
2
Rw
4-3
EgWs1
3-2
Eg1
2-3
Ih5
2-3
Ih3
6-7
619

Format 3: B&W e.g. Craik RM 186 RMs

(not an easy read but GOOD information)



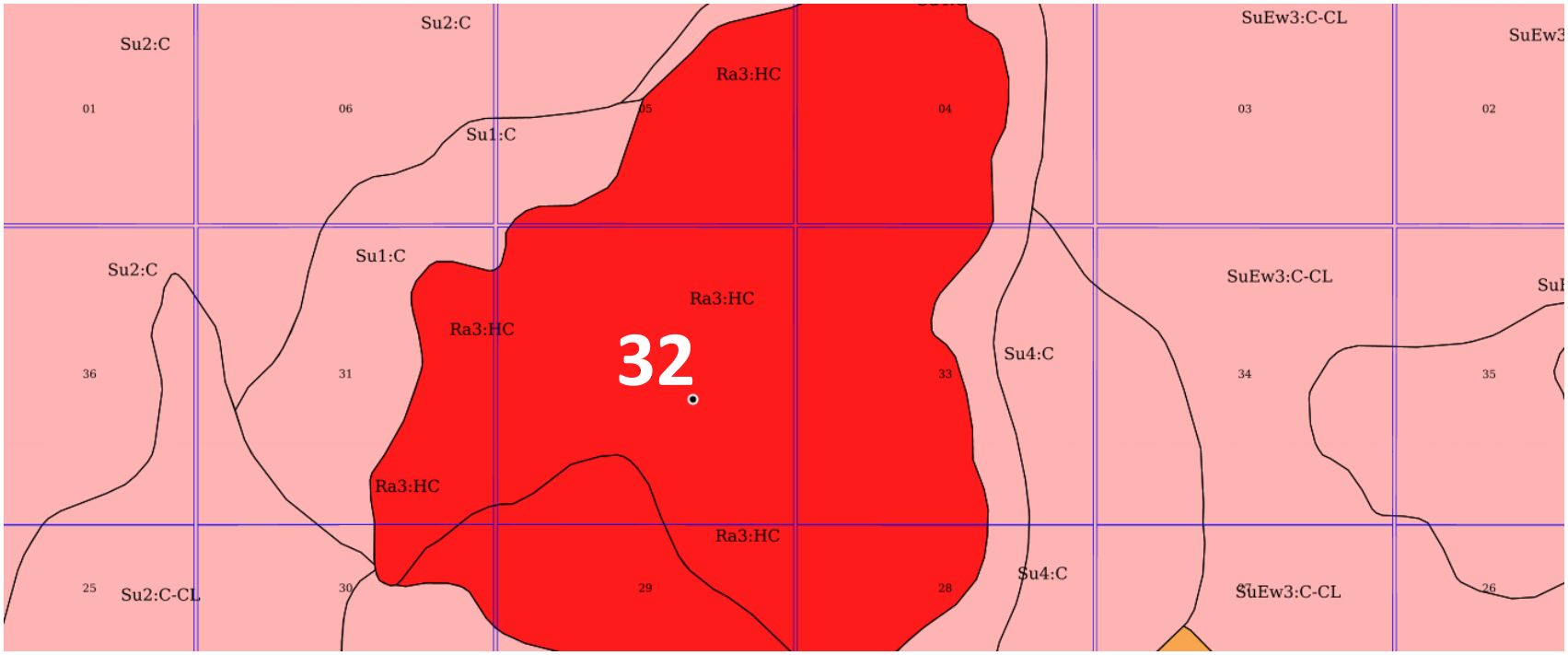
4. The Need for the Future

*To be useful for agronomy, the second survey needed be combined into one uniform format which will form the base on which to build Precision Ag and Agronomy for the future.

*Thanks to Dr. Angela Bedard-Haughn this has been done in the on-line form of SK SIS

..... a sneak peak

FROM SK SIS

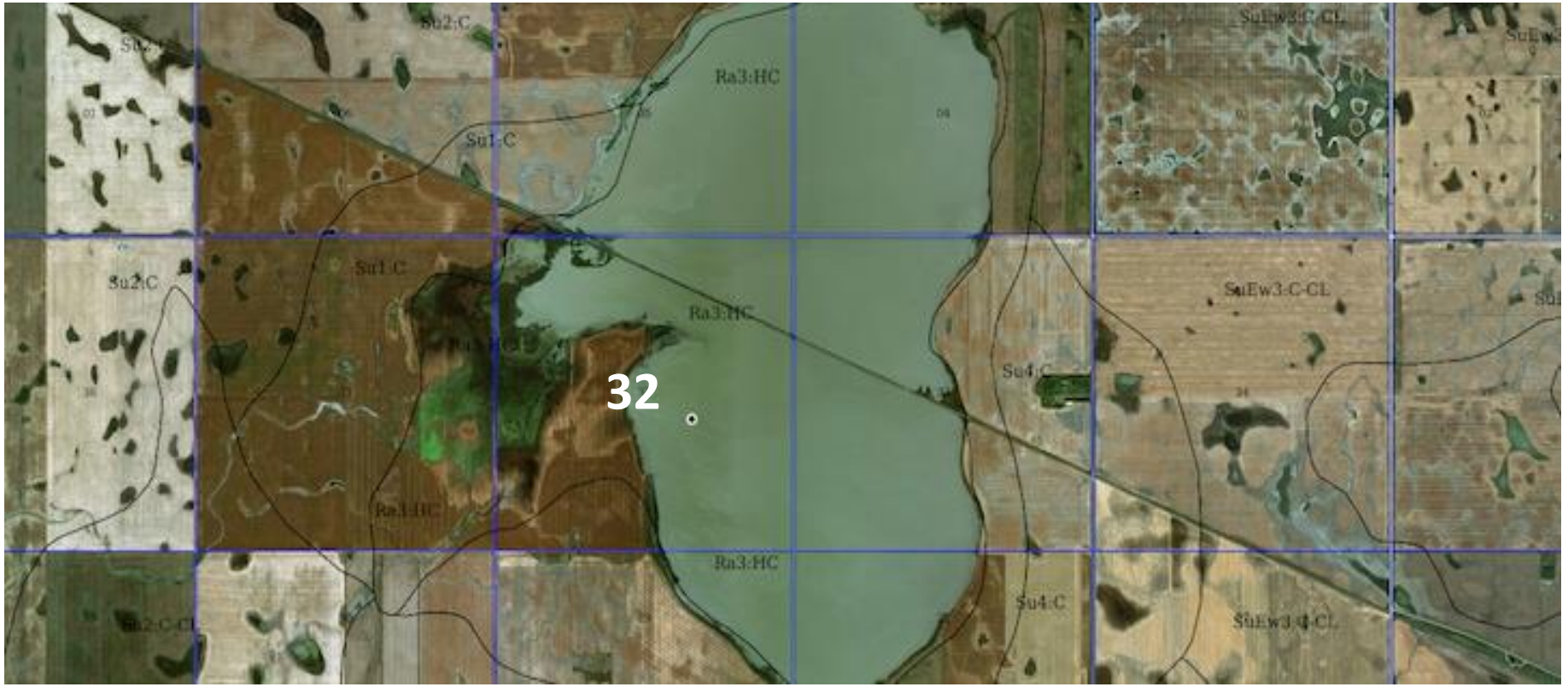


Tp 29 R13 W3 – between Rosetown and Sovereign

RED-Regina 3 Heavy Clay:3 = Gleysolic (poorly drained)

Field work done in mid 1960s.

ALSO FROM SK SIS



~ 2012 AIR PHOTO : RA 3 HC - IS NOW A 2000 ACRE SLOUGH

THE KEY IS IN THE MAP UNIT 3 = GLEYSOLIC = POORLY DRAINED

For Soils and Crops 2018 we have:

A large screen and an IMAC running SK SIS

(Large screen compliments AAFC – Erl Svendsen- Thanks Erl)

An IMAC running CANSIS – which provides PDFs of ALL Canadian soil maps

Displays of paper copies of First and Second Soil survey

..... Paper copies of First Soil Survey maps #12 #13

Paper copies of Second soil survey:

NTS Map Sheets (all of them)

Atlases (all of them)

RM maps (a few examples)

We have copies of most maps that you can take with you at no charge

If we run out today we can get more for tomorrow

REMEMBER:

PDFs of all paper maps are available at CANSIS

http://sis.agr.gc.ca/cansis/publications/surveys/index.html

THE
END
??????????